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in their origin. Since the Japanese had fierce wars with the Ainos it would be past believing that they—bitter enemies as they were of the Ainos—would refrain from any feeling of delicacy in fastening every possible stigma, in reporting every possible crime about them.

The Ainos were looked upon as debased, as having an animal origin; what more probable than that every hideous feature of their life be recorded and perpetuated?

This important evidence being wanting, Mr. Siebold tries to make out that the Japanese were cannibals. Does he do this on the strength of their own historians or Chinese chroniclers? No, but on the testimony of Marco Polo! He who found in Japan temples roofed and paved with massive gold, who saw quantities of precious stones, who describes an invasion and storming of a city, the garrison put to death, all excepting eight, who by the efficacy of a charm introduced between the skin and the flesh of the right arm which rendered them proof against sharp swords, either to being killed or even wounded, and so they had to be beaten to death with wooden clubs!

In the face of the records we have preserved to us by the Japanese annalists, of the etiquette at the table, the dishes used at their feasts and offerings, and later still the development and institution of the refined and delicate ceremony of tea drinking, the *cha-no-yu*, not to speak of the persistence of their religious prejudice against the eating of flesh, is it possible that Mr. Siebold can really give credence to the following circumstantial account of Marco Polo. This extraordinary writer says, "that these people on capturing an enemy that was not ransomed, invited to their house all their relations and friends, and putting the prisoner to death, dress and eat the body in a convivial manner," etc., etc.

With these few criticisms, Mr. Siebold's work must be looked upon as a most excellent contribution to a knowledge of the archæology of Japan.—*E. S. Morse.*

BALFOUR'S COMPARATIVE EMBRYOLOGY.[1]—Only within a year or two, owing to the rapid advances made in our knowledge of the embryology of the invertebrate animals, could this book have been prepared. It comprises a body of facts and, in the main, probably sound generalizations, which afford the student the only starting point for studies of this sort. The author has brought to his task much experience in the embryology both of vertebrates and invertebrates, and this knowledge, with wide reading and good critical powers, have rendered the book a reliable, standard authority. As such it is most useful and timely.

The first volume is confined to the many-celled invertebrate animals, beginning with the sponges and ending with the Echinoderms; the Protozoa not being considered. The author has evidently adopted Lankester's classification, as the Tunicata are not referred to in this volume, and will, undoubtedly, be taken up in the vertebrate volume.

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[1] *A Treatise on Comparative Embryology.* By FRANCIS M. BALFOUR, F.R.S. In two volumes, Vol. I. London, Macmillan & Co., 1880. 8vo, pp. 492, XXII. $4.50.

The introduction treats of the development of the ovum and spermatozoön, the maturation and impregnation of the ovum, and its mode of segmentation. These subjects are treated in a clear way, with an abundance of illustration, and this portion will be found as useful as any part of the book, since the phenomena have been traced by but a few and are rather difficult to comprehend.

The introduction to systematic embryology refers to the mode of origin of the germinal layers, and the gastrula, both by invagination and by delamination, the figures very clearly showing these different modes of development of the germinal layers and primitive digestive cavity. We observe that Mr. Balfour uses the convenient terms morula and gastrula to express the two earlier stages in the life history of most animals, though he is unable to perceive a true gastrula condition in the Tracheata.

The remainder of the work is devoted to special accounts of the mode of development of such types of the different classes as have been studied. These include the Dicyemidæ and Orthonectidæ, Porifera, Cœlenterata, Platyelminthes, Rotifera, Mollusca, Polyzoa, Brachiopoda, Chætopoda, Discophora, Gephyrea, with references to the aberrant types of Chætognatha, etc., Nemathelminthes, ending with the Tracheata, Crustacea, Pœcilopoda, Echinodermata and Enteropneusta, in the order here given. This order represents the author's views as to the classification, or what is but another name for it, the phylogeny of the invertebrates. We are gratified to see that the author assigns the sponges to a group by themselves, while the Mollusca have the same rank assigned to them as to the Polyzoa or Brachiopoda. We scarcely see why the Echinoderms are placed so far away from the Cœlenterates and worms.

At the end of nearly every chapter, after treating of the individual development, that of the organs is discussed, and finally, as in that on the insects (Tracheata), we are treated to a rehearsal of the general mode of formation of the layers and embryonic envelopes, with a full bibliography. As regards the latter it would be much more convenient to the student, especially the beginner, if the works had been cited in the order of publication, so as to induce one to study the history of the literature. After treating of the Tracheata and Crustacea, and Pœcilopoda, Pycnogonida, Pentastomida and Tardigrada, an excellent summary of Arthropodan development is given.

The theoretical portion relating to phylogeny is kept apart, and is discussed in a generally conservative and judicious way; the bearings of palæontology, though of primary importance as checking too free interpretation of purely embryological processes, are not discussed. In the introduction the credit of the correlation of the development of the individual and the class to which it belongs, should have been given to Agassiz and to Milne-Edwards, however much it has been extended and modified by later evolutionists. We find little to criticise in the author's general views. The illustrations, where originally prepared for the work, are nearly faultless, with two or three exceptions.

THE ODONTORNITHES, OR BIRDS WITH TEETH.[1]—The present memoir presents the results obtained by Prof. Marsh from the study of the remains of this interesting group, procured by him during the last ten years. It is generally known that the specimens which represent the *Odontornithes* have only been found in America in the Niobrara Cretaceous, or No. 3 of Meek and Hayden, and within the geographical limits of the State of Kansas. Prof. Marsh's book sets forth principally the osteology of four species of the group, viz: *Hesperornis regalis*, *Apatornis celer*, *Ichthyornis dispar* and *Ichthyornis victor*, all discovered and named by himself. This work appears to have been well done, and it is worthily supplemented by thirty-four good lithographic plates. The conclusions of the author respecting the affinities of the genera of which he treats, are fully and clearly set forth. His discussion of the probable phylogenetic relations of *Hesperornis* are especially interesting. He shows that the modern affinities of this genus are with the Struthionoid types, while those of *Ichthyornis* and its allies are remotely to the *Longipennes*. He includes *Archæopteryx* in the same primary division. Thus constituted the *Odontornithes* are a group "homologous" with a part (perhaps all) of the remainder of the class Aves, and the two great divisions thus formed embrace corresponding or "heterologous" subgroups. In his discussions the author adopts the theory of the production of modification of structure by use, a doctrine first fully formulated in an essay in this journal.[2]

A supplement to the chapters above mentioned includes a synopsis of all the species of birds hitherto found in the Cretaceous formations of North America, twenty in number, all named by the author. We should like to have seen introduced here some clear descriptions of several of the genera named by Prof. Marsh, but whose characters we are yet unacquainted with. Some reference to the first discovery of birds with biconcave vertebræ in England by Seeley, in 1870,[3] would also have been in place. Mention of the extent and character of the services for which Mr. Oscar Harger is thanked in the introduction, would also have been proper.

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[1] *The Odontornithes, or Birds with Teeth.* By O. C. MARSH. Memoirs of the Peabody Museum of Yale College, Vol. I, 1880. 4to, pp. 200.

[2] 1871, p. 603. Proceed. Amer. Philos. Soc., 1871, 253.

[3] *Annals Magaz. Nat. Hist.*, p. 129.